CLAIMS

What is claimed is:

proper for 385/52

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1. An alignment process for a fiber optic system including at least one lens and a tunable filter element, the process comprising:

   transmitting an optical signal into the system;

   detecting a back-reflection from the lens and/or the tunable filter element;

   manipulating a position of the lens relative to the tunable filter element in response to the back-reflection.

2. An alignment process as claimed in claim 1, wherein the step of transmitting the optical signal into the system comprises transmitting the optical signal via a fiber pigtail of the system.

3. An alignment process as claimed in claim 1, wherein the step of detecting the back-reflection comprises detecting an optical signal coupled into a fiber pigtail of the system from the system.

4. An alignment process as claimed in claim 1, further comprising inserting a mirror optically between a first lens and a second lens in the fiber optic system.

5. An alignment process as claimed in claim 4, further comprising transmitting an optical signal to the fiber optic system via a fiber pigtail while detecting back reflections from the mirror.

6. An alignment process as claimed in claim 5, further comprising moving the first lens relative to an endface of the fiber in response to backward coupling of the optical signal into the fiber from the mirror.

7. An alignment process as claimed in claim 6, further comprising translating a second lens in the optical train in response to a level of back reflections from the filter element with the mirror removed.

8. An alignment process as claimed in claim 1, further comprising:
coating the filter to be reflective at a predetermined wavelength; and
tuning the optical signal to the predetermined wavelength.

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9. An alignment process as claimed in claim 1, further comprising:
optically inserting camera into an optical link of the optical system;
generating an image of the lens, and
translating the lens relative to optical system in response to the image.

10. An alignment process as claimed in claim 9, further comprising:
removing the imaging device from the optical path; and
inserting the fiber pigtail into the optical system.

11. An alignment process as claimed in claim 10, further comprising:
exciting the optical train with a signal via the optical fiber;
detecting a ratio between two optical modes in a backreflection signal from the optical system.

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12. An alignment system for an optical system comprising a lens and a tunable filter element, the process comprising:
an optical signal source;
an optical signal detector for detecting back-reflections from the optical system; and
a reflective element in an optical link that produces the back-reflections;
a manipulation system for moving the lens and tunable filter element relative to each other in response to the back-reflections.

13. An alignment system as claimed in claim 12, wherein the optical signal source that emits radiation at a frequency not coinciding with a resonant peak of the tunable filter element.

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14. An alignment system as claimed in claim 12, wherein the reflective element is insertable such that it is orthogonal to an axis of an optical path of the optical system.

15. An alignment system for an optical system comprising a lens and a tunable filter element, the process comprising:

an optical signal source;

an optical signal detector for detecting back-reflections from the optical system; and

camera that is detects an optical signal that is tranmitted through at least part of an optical link to detect back-reflections; and

a manipulation system for moving the lens and tunable filter relative to each other in response to an image detected by the camera.

16. An alignment process for a fiber optic system including at least one lens and a tunable filter element, the process comprising:

transmitting an optical signal into the system;

optically inserting a camera into an optical link of the optical system;

generating an image of the lens, and

translating the lens relative to optical system in response to the image.

17. An alignment process as claimed in claim 16, wherein the step of transmitting the optical signal into the system comprises transmitting the optical signal backwards through the optical system.

18. An alignment process as claimed in claim 16, wherein the optical signal is tuned to a passband of the tunable filter.

19. An alignment process as claimed in claim 16, further comprising:

removing the camera from the optical path; and

inserting the fiber pigtail into the optical system.

20. An alignment process as claimed in claim 16, further comprising:

exciting the optical train with a signal via an optical fiber;

detecting a ratio between two optical modes in a backreflection signal from the optical system; and

aligning the system to minimize the ratio.

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21. An alignment process for a fiber optic system including at least two lenses and a tunable filter element, the process comprising:

transmitting an optical signal into ~~the system~~;

optically inserting camera into an optical link of the optical system;

generating an image of a first lens, and

translating optical elements of the fiber optic system in response to the image of the first lens;

generating an image of a second lens, and

translating optical elements of the fiber optic system in response to the image of the second lens.

22. An alignment process as claimed in claim 21, wherein the step of transmitting the optical signal into the system comprises transmitting the optical signal backwards through the optical system.

23. An alignment process as claimed in claim 21, wherein the optical signal is tuned to a passband of the tunable filter.

24. An alignment process as claimed in claim 21, further comprising:

removing the camera from the optical path; and

inserting the fiber pigtail into the optical system.

25. An alignment process as claimed in claim 21, further comprising:

exciting the optical train with a signal via an optical fiber;

detecting a ratio between two optical modes in a backreflection signal from the optical system; and

aligning the system to minimize the ratio.

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26. An alignment system for an optical system comprising a lens and a tunable filter element, the process comprising:

attaching a fiber pigtail to the system;

transmitting a broadband signal through the optical system; and

positioning an endface of the fiber relative to the tunable filter to maximize a ratio between a lower order mode and a next higher order mode.

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